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DENNISON, SCHULTZ & MACDONALD
SUITE 105
1727 KING STREET
ALEXANDRIA, VIRGINIA 22314-2700
703 837-9600

REMARKS

The Office action of March 14, 2008, has been carefully considered.

Claims 3 and 4 have been withdrawn per the restriction requirement mailed December 6, 2007. The Office action states that while Applicants argued that the special technical feature linking the four claims is a "pure aluminum sheet with a special concentration of carbide at its surface, no special content of aluminum carbide is reflected in Claims 3 and 4 and as such the special technical feature cannot be said to rely on a concentration of aluminum carbide." Applicants believe that this statement is incorrect, as Claim 3 depended from Claim 1, and Claim 1 certainly did recite a special concentration of aluminum carbide. In order to permit further resolution of this issue, Claims 3 and 4 have now been rewritten as new Claims 7 and 8, with Claim 7 written in independent form and reciting an atomic content of between a 5 and 25% for aluminum carbide. Claims 7 and 8 are identified as being "new and withdrawn," but Applicants submit that these claims should be examined.

Claims 1 and 2 have been rejected under 35 USC 103(a) over Fujihira in view of Hong et al.

Claims 1 and 2 have now been rewritten as new Claims 5 and 6, respectively. Claim 5 recites the structure of the thin refined aluminum sheet or strip in greater detail, reciting that the sheet or strip has a surface layer of oxide and an interface between the aluminum and oxide layers which is 10 nm thick and has an atomic content of aluminum carbide of between 5 and 25%.

The Office action argues that Fujihira et al teaches a thin aluminum foil sheet having high purity and an oxide outer layer, with a boundary region containing at least one etching-nuclei forming element which can be carbon. Hong et al has been cited to show that it is known to utilize a precursor gas

to form a diffusion barrier layer on the surface of a metal conductor in a semiconductor device. The Office action concludes that it would have obvious to combine the disclosures of Fujihira et al and Hong et al to obtain a thin aluminum sheet containing 5 to 25 atomic percent of aluminum carbide in a 10nm thick surface layer.

Applicants submit, however, that the cited references, taken individually or in combination, do not render the claimed invention obvious. Quite to the contrary, Fujihira et al discloses a thin aluminum foil sheet having at least one nuclei forming element which may be carbon, and when carbon is present, it is present in the sheet at a concentration of 1-40 ppm (column 5, line 8). A higher concentration of the nuclei forming element is present at the interface, but the maximum concentration present is only about 30 times the concentration present in the sheet. Thus, the maximum concentration of carbon which could be present in the barrier layer of Fujihira et al is 1200 ppm, much less than the claimed concentration. Moreover, Fujihira et al discloses that the nuclei forming element is present in a layer which is about 2 nm (column 2, lines 19-34), so Fujihira et al does not suggest an interface which is 10 nm thick,

Accordingly, Fujihira et al does not by itself disclose aluminum sheet or strip with an interface layer 10 nm thick containing between 5 and 25 atomic percent aluminum carbide.

Hong et al discloses a method for forming a diffusion barrier on a conductor or semiconductor surface, and more specifically between the conductor or semiconductor surface and a dielectric material. The field of this invention is quite different from that of both Fujihira et al and the claimed invention, such that one of ordinary skill in the art would not look to Hong et al in order to improve the performance of the electrolytic aluminum capacitor foil.

Moreover, Hong et al discloses at column 3, lines 15-30,

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that the barrier can be formed from a metal oxide or aluminum carbide, but a barrier layer between aluminum metal and aluminum oxide is not disclosed or suggested.

Hong et al teaches a method for forming an intermediate layer which is essentially 100% carbide. Such a layer is contrary to Fujihira et al, which teaches that a higher concentration than that disclosed would cause excessive etching (column 5, lines 12-13) and then a decreased capacitance; utilizing the method of Hong et al to obtain a much higher carbide content in the intermediate layer would be contrary to the teachings of Fujihira et al.

It is noted moreover that the present specification, in the paragraph bridging pages 6 and 7, states that carbon is only very slightly soluble in solid aluminum, and since the carbide present the aluminum body is very stable, carbon contained in the aluminum mass cannot migrate to the surface. Hence, the concentration of aluminum carbide present according to the claimed invention cannot be present in the product of Fujihira et al. In order to obtain such levels of carbon at the interface, an outside source of gaseous carbon is necessary to react with the aluminum at high temperatures.

As Fujihira et al discloses low levels of carbon at the interface between the aluminum and the aluminum oxide, and teaches against higher levels of carbon at the interface as is presently claimed, the invention is clearly patentable over Fujihira et al and Hong et al and withdrawal of this rejection is requested.

A reference to the PCT application on which the present application is based has been added to the specification.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

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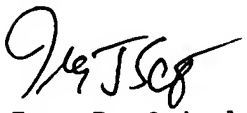
Respectfully submitted,



Ira J. Schultz
Registration No. 28666
Attorney for Applicants
(703)837-9600, ext. 23

LAW OFFICES
DENNISON, SCHULTZ & MACDONALD
SUITE 105
1727 KING STREET
ALEXANDRIA, VIRGINIA 22314-2700
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